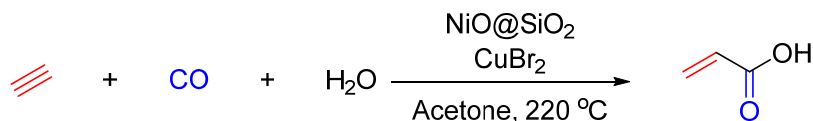


NICKEL OXIDE CATALYZED HYDROXYCARBONYLATION OF ACETYLENE TO ACRYLIC ACID

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Acrylic acid is the simplest unsaturated carboxylic acid which can be transformed to functional polymer such as poly acrylic acid, poly (ethylene-co-acrylic acid), poly (2-hydroxyethyl acrylate), etc [1-3]. Acrylic acid is industrially produced via propylene oxidation. Because propylene is originated from petroleum, new synthetic routes that reduce the use of petroleum derived chemicals are required to withstand an increasing oil-price [4]. We report in this presentation a nickel oxide@silica core@shell catalyst (NiO@SiO₂) for acetylene hydroxycarbonylation as an alternative to propylene oxidation. NiO@SiO₂ provided the higher yield and reaction rate than commercial nickel oxide catalyst on acetylene hydroxycarbonylation. The carbon monoxide/acetylene ratios, copper co-catalyst greatly affect the reaction rate and product yield. We also found the self-inhibition of the acrylic acid on acetylene hydroxycarbonylation. The silica shell protected the nickel oxide from sintering during the reaction, however, the catalyst was deactivated by coke formation attributed to acetylene decomposition. The detailed experimental results and plausible reaction mechanism will be presented in the poster section.



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